

IAS Critical Design Review



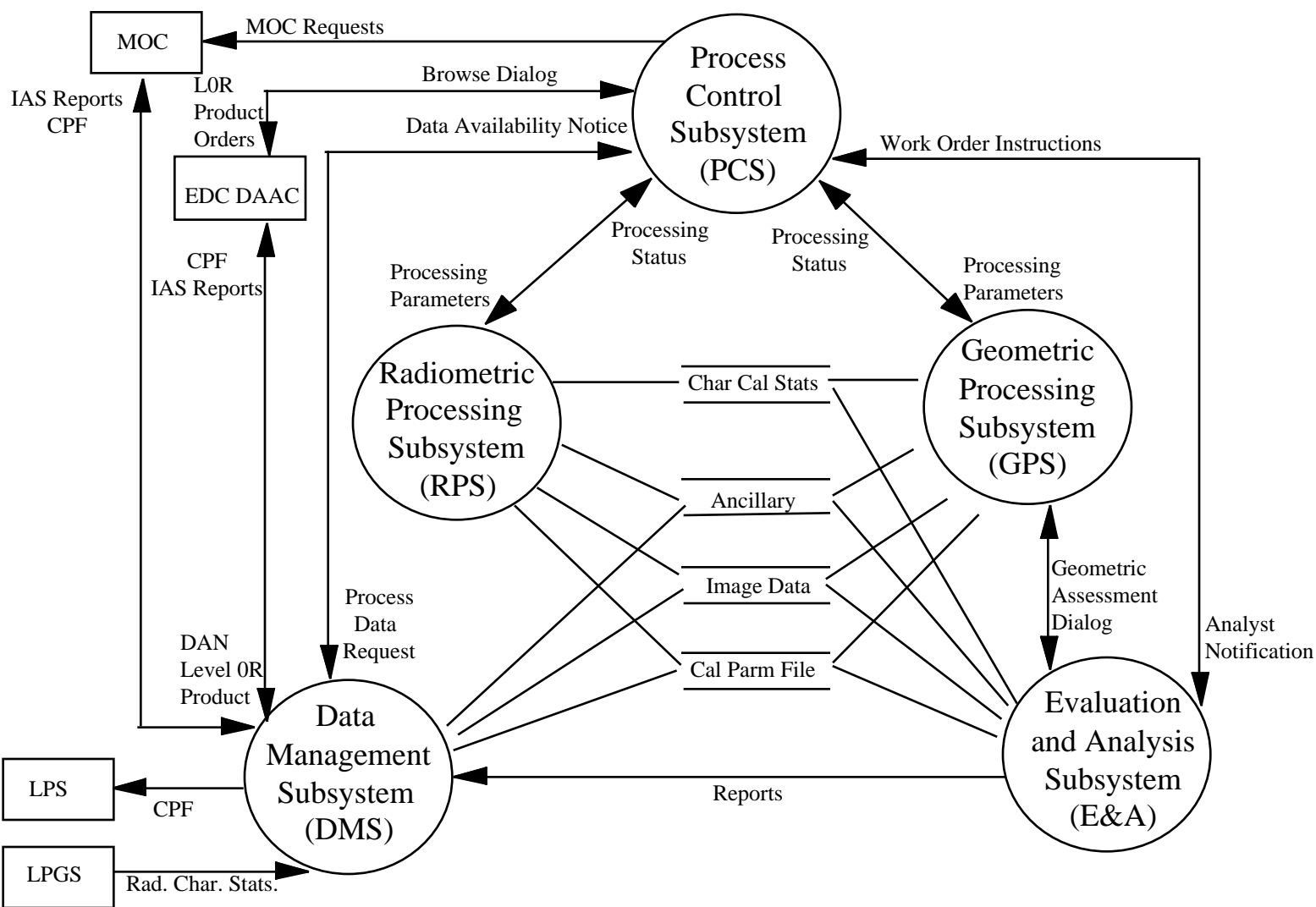
Agenda

- | | |
|----------------------------------|--------------------------------|
| • Introduction | R. Schweiss |
| • Design Overview | S. Johnston |
| • Hardware Architecture | C. Brambora |
| • Operational Scenarios | S. Johnston |
| • Software Design | |
| – Overview | J. Hosler |
| – Operations Interface | J. Whelan |
| – Management and Control | A. Williard |
| – Database | A. Williard |
| – L1 Processing | T. Ulrich |
| | J. Storey |
| – Evaluation and Analysis | D. Kaufmann/M. Schienle |
| • System Test | E. Crook |
| • Conclusion | R. Schweiss |

IAS Critical Design Review



IAS Subsystems



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IAS Subsystem Definitions (1 of 2)

- **Process Control Subsystem (PCS)**
 - Provides the tools needed by the IAS Operator to plan and manage the processing being performed by the IAS
 - Controls the execution of Radiometric and Geometric Processing Subsystem applications by initiating and managing Work Order processing

- **Data Management Subsystem (DMS)**
 - Manages ingest and storage of data from external systems
 - Performs quality checking and correction of LOR Products
 - Manages IAS on-line data storage and archival
 - Formats IAS outputs for, and manages data transfer to, external systems



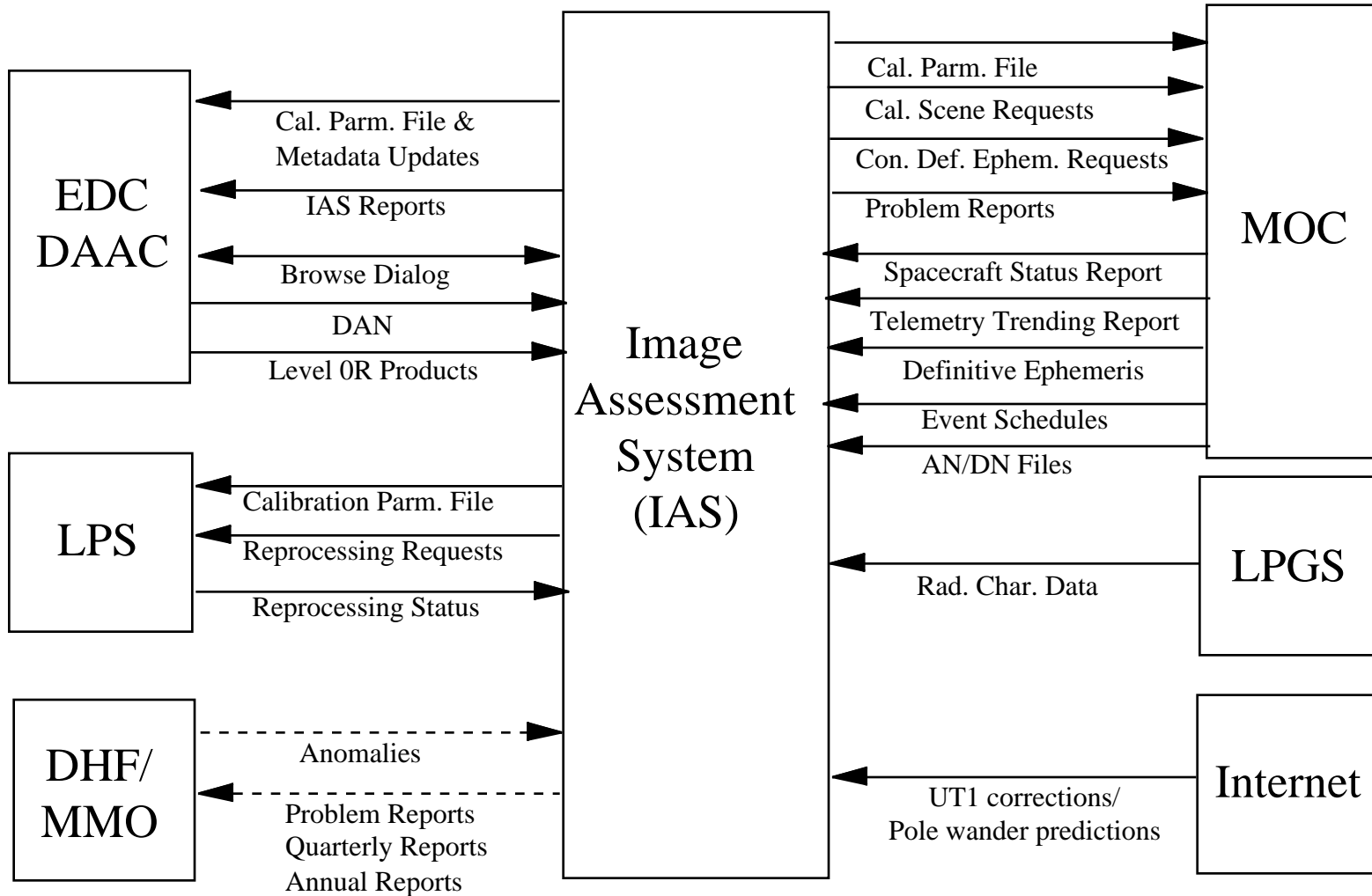
IAS Subsystem Definitions (2 of 2)

- **Evaluation and Analysis Subsystem (E&A)**
 - Provides the Toolkit used by the IAS Analyst in evaluating and analyzing the performance of the ETM+ instrument and in maintaining the Calibration Parameter File
 - Includes tools for viewing IAS inputs and results, image processing, statistical analysis, and report generation
- **Radiometric Processing Subsystem (RPS)**
 - Provides all functionality required for Level 1R product generation, radiometric calibration, and radiometric characterization and evaluation
- **Geometric Processing Subsystem (GPS)**
 - Provides all functionality required for Level 1G product generation, geometric calibration, and geometric characterization and evaluation

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IAS Interfaces



----- Indirect Interface
———— Direct Interface

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IAS Interfaces

- **IAS to MOC**
 - Landsat 7 MOC to IAS ICD 511-4ICD/0197, Baseline 1/97
 - Update pending lamp cycling issues
 - All transfers using FTP put (MOC and IAS)
 - Two formats for calibration scene requests (PAC/FAC vs. GLC)
- **IAS to LPS**
 - ICD Between IAS and the LPS, 514-1ICD/0195, Rev. 1 7/96
 - CPF sent via FTP (backup via media)
 - Reprocessing Requests via e-mail (backup is paper)
- **IAS to EDC DAAC**
 - ECS to Landsat 7 ICD listed in reference documents
 - Browse dialog and Level 0R Products via user interface
 - IAS gets L0R product when made available
 - CPF to DAAC via IAS notification and DAAC get
 - Reports to EDC DAAC Guide Server

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IAS Interfaces (continued)



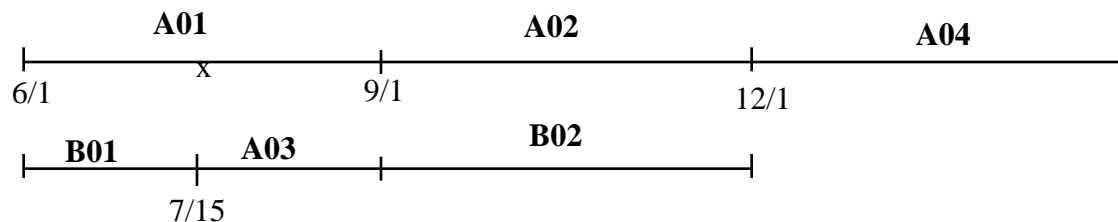
- **LPGS to IAS**
 - **ICD Between IAS and LPGS, Draft 1/97**
 - **Electronic transfer (potential DB link)**
 - **Tape Backup**
- **Other Interfaces**
 - **IAS reports sent to the MMO via e-mail or paper**
 - **Anomalies coordinated with DHF (EDC facility)**
 - **IAS retrieves UT1 corrections from USNO via the internet**

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Calibration Parameter File



- **Format is HDF/ODL**
- **Four components**
 - Radiometric parameters
 - Geometric parameters
 - Time correction coefficients
 - Fixed parameters
- **Distributed to:**
 - LPS for use in Level 0R Processing, ACCA
 - EDC DAAC for distribution with Level 0R products
 - MOC for forwarding to IGSs and use by FDF
- **Updated on regular 90 day cycles at minimum**
 - Effectivity dates (begin/end) first two parameters of file
 - File naming convention (L7yyyydddIASCAL.Vnn)





IAS Reports

- **Calibration Reports**
 - **CRaM Pre-fit**
 - **CRaM (Combined Radiometric Model)**
 - **Ground Look**
 - **Sensor Alignment**
 - **Scan Mirror**
 - **Band Alignment**
- **Assessment (or Characterization) Reports**
 - **Detector Status (Inoperable and degraded)**
 - **Saturated detector**
 - **Impulse noise**
 - **Random noise**
 - **Histogram analysis**

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IAS Reports (continued)

- **Assessment (or Characterization) Reports (cont.)**
 - **Coherent noise**
 - **Scan Correlated Shift**
 - **Memory effect**
 - **Banding**
 - **Striping**
 - **MTF**
 - **TM Initialization (metadata item validation)**
 - **Geodetic Accuracy**
 - **Band to Band Registration**
 - **Image to Image Registration**
 - **Geometric Accuracy**
 - **Level 0R product quality (from ingest and TMINIT checks)**

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IAS Reports (continued)

- **Problem Reports**
 - Identified problem
 - Request for telemetry trending from MOC
- **Anomaly Investigation Reports**
- **Quarterly Summary Reports**
 - Summaries of calibrations and assessments
 - IAS performance summary
 - Any significant problems and trends
 - Changes to CPF and their reasons
- **Annual Reports**